

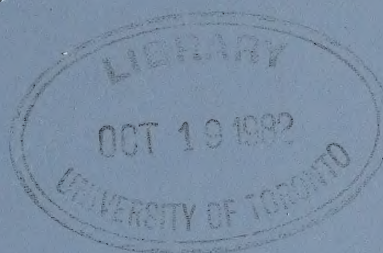
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GUIDELINES TO PREPARE AN  
ENVIRONMENTAL IMPACT STATEMENT  
FOR THE PROPOSED  
MACKENZIE RIVER DREDGING PROGRAM



Issued by:  
Mackenzie River Dredging Program  
Environmental Assessment Panel  
H.M. Hill, Chairman

For:  
  
Chairman  
Environmental Assessment Panel Office  
Ottawa, Ontario

Pêches  
et Environnement  
Canada

Fisheries  
and Environment  
Canada

July 8, 1976



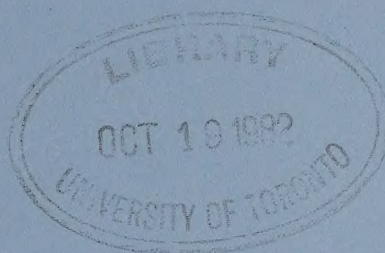




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## 2. PROJECT PROPOSAL

### 2.1 Declaration

The initiator should be identified and should take responsibility for statements and judgements in the EIS. Any environmental consultant(s) should be identified.

### 2.2 Rationale

State reason(s) why the program is proposed. Document the present and future demand for freight transportation. Discuss the demand timing and various means to satisfy this demand. Document existing barge traffic logistics en route downriver.

### 2.3 Alternatives

All alternatives, including dredging, not dredging, or partial dredging should be discussed. All project alternatives including those for logistics support, whether they be location, design or time schedules, should be included. In a general way this subsection should describe the constraints and advantages of these alternatives, and should indicate the depth of study which lead to the rejection of the alternative solutions.

### 2.4 Associated Projects

Directly associated projects resulting from this program on the Mackenzie River, which in turn may or will cause environmental degradation or benefits, should be identified and their inter-relationship discussed whether or not they fall within the jurisdiction of the initiator. No detailed discussion of the proposed Mackenzie Valley Pipeline or the Mackenzie Highway is required in this statement except to identify the relationships between these proposals and 2.2 above.



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## 2. THE PROPOSAL(S)

Alternatives not discarded in 2.3 above should be discussed fully under each of the following headings. Factors common to all alternatives may be discussed first, followed by a description of factors peculiar to individual alternatives.

### 3.1 General Layout

The locations of dredging operations and spoil deposition should be shown using large scale hydrographic charts and topographic sheets. Hydraulic control areas must be located and river cross-sections supplied for areas of proposed cuts.

### 3.2 Dredging Details

The following should be outlined:

- (a) the method of dredging and timing for each site;
- (b) the volume of spoil, its placement and method of disposal for each site;
- (c) details of crew camps specifying such things as location, types man days and periods of use;
- (d) details of winter staging and storage areas;
- (e) any water use, effluent discharges, disturbance factors such as noise and crew movement, and aesthetic effects which will occur in the river and/or the surrounding valley as a result of the operation;
- (f) details of support logistics, i.e. helicopter traffic, fuel storage, etc.

### 3.3 Maintenance Dredging

As most river dredging projects require maintenance the following should be outlined:

- (a) the frequency and extent of required maintenance dredging in the various parts of the river;
- (b) those factors mentioned in 3.2 (a-f).

4. ENVIRONMENTAL IMPACTS IN RELATION TO ENVIRONMENTAL, ECONOMIC AND SOCIAL VALUES

The assessment of short and long term potential impacts shall be made on the basis of information collated from existing sources and on information collected in the field to supplement what is available.

Deficiencies resulting from data gaps or existing inadequate information shall be identified together with the limitations they have imposed upon the Environmental Impact Statement.

Potential environmental impacts in the area to be affected by the proposed development shall be discussed in terms of existing environmental, economic and social values and shall be identified in the design, construction, operation and maintenance phases of the project. These values shall be considered as international, national, regional, local or site-specific.

Information that may be required to carry out a satisfactory assessment shall include but shall not necessarily be restricted to topics below. Options and measures available to avoid, minimize or mitigate harmful effects and to enhance beneficial effects shall be investigated and discussed under each topic. Impacts identified as major (more important) shall be discussed in detail in Section 5.

Consider and discuss potential environmental impacts of the proposal, including ancillary or spin-off development in the area to be affected by the proposal, concentrating on the areas affected by dredging, spoil deposition and changes in water levels and velocities in terms of:



#### 4.1 Climate

The general climatological features which affect the Mackenzie and tributary rivers, especially those aspects which exert a major influence on the river system regime, and particularly those features which will have an effect on the timing and extent of dredging operations, both initial and maintenance.

#### 4.2 Bank and Bottom Conditions

The banks of the river and islands in the areas of dredging and spoil deposition. Substrate descriptions and stabilities.

#### 4.3 Sediment

The particle size distribution and settling rate of materials from areas to be dredged. Further factors such as sediment chemistry and bacteriology in areas of possible contamination due to human sewage or industrial effluents.

#### 4.4 Hydrology

Water level hydrographs and flow characteristics during the open water season related to dredging and spoil deposition (the extremes and average conditions). Water quality, sediment transport, area of sediment build-up and erosion, and areas subjected to significant ice erosion. Effect on spring break-up, and of spring break-up on tributaries which are or may be crossed by the Mackenzie Highway or pipelines.

#### 4.5 Flora

Plant communities, both aquatic and terrestrial, that may be affected as a result of dredging. Size and location of each community and their species composition and abundance for the area affected by dredging, spoil deposition and changes in water levels or velocities.



#### 4.6 Fish

Existing fish populations, their habitats, migratory routes and seasonal distribution. Detailed mapping may be a convenient method of delineating such habitats as spawning and nursery areas. The locations and other aspects especially size, timing and social importance, of any sport, commercial or domestic fishery.

#### 4.7 Birds

Resident, spring, and fall migrant waterfowl populations, their staging, nesting and feeding areas. Areas of importance to all raptors peregrine falcons, gyrfalcons, and areas critical to other species of birds. The effects of disturbance and displacement on all species and especially on peregrine falcons.

#### 4.8 Mammals

Habitats of importance to populations of mammals, particularly aquatic. Attention should be given to areas in which registered traplines are located.

#### 4.9 Water Use

Existing water uses for recreational, domestic or industrial purposes.

#### 4.10 Archeological sites

Archeological sites in the area of the project.

#### 4.11 Summary

Summarize concerns raised and options and measures available to alleviate those concerns. Identify major concerns for detailed discussion in the following section.



## 5. MAJOR ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

Discuss those long and short term environmental impacts that enhance, disrupt, impair or destroy existing features, conditions or processes in the natural environment; or cause enhancement of, or conflict with, established, traditional or historic land use and ways of life; or interfere with the livelihood of segments of the human inhabitants (deleterious as well as beneficial impacts).

Discuss mitigating or ameliorating measures that can eliminate or reduce the severity of deleterious impacts through changes in location and design of facilities, the scheduling of associated activities, the rehabilitation of impaired features, or through the environmental education of the construction and operational staff. Where applicable, measures to enhance beneficial impacts will be identified and discussed.

Discuss in detail all major impacts and appropriate mitigating measures. Items that may be of concern are included in but not necessarily restricted to the following list: (a general statement of intent with respect to various phases of the proposed development may keep the discussion from being repetitious).

- 5.1 Detrimental effects resulting from alteration of water levels and other changes in stream characteristics throughout the system.
- 5.2 Change in water regime and deposition of dredged spoils on domestic, sport and commercial fisheries throughout the system with special emphasis on the Mackenzie Delta and that portion of the river above the confluence with the Liard River.



- 5.3 Disturbance of bird populations with emphasis on the peregrine falcon nesting areas along the Mackenzie, and displacement of staging and migrating waterfowl in the Bear-Mills Lake area.
- Effect on aquatic habitat of deposition of dredged spoils.

## 6. RESIDUAL IMPACTS

Discuss impacts that will remain after all practicable mitigating measures have been incorporated into the development proposal. State nature, extent and duration of all such environmental impacts in the environmental, economic and social sphere and in the international (e.g. Migratory Birds Convention Act), national, regional, local and site specific context.

## 7. MONITORING

Plans for monitoring as a result of detailed analysis of an environmental concern should be described. Discussions should be undertaken with Inland Waters Directorate, DOE, concerning the establishment of a gauging station at least one year prior to project initiation in order to be able to relate future water levels to existing gauging information. Efforts should be made to identify archeological sites during program implementation (discussion with DINA and/or the National Museums/Museum of Man should be undertaken).

## 8. PUBLIC PARTICIPATION

Public participation and information programs pertaining to the dredging program should be described. Results of the program should be stated briefly.

## 9. APPENDICES

To be included as appendices in the EIS are:

1. An annotated list of references cited;
2. A list, with addresses of all consultants and government agencies associated with studies and evaluations along with the names of the individuals involved.













